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well-grounded expectations so far fulfilled. May this method of security from the destructive violence of one of the most awful powers of nature meet with such further success, as to induce every good and grateful heart to bless God for the important discovery. May the benefit thereof be diffused over the whole globe. May it extend to the latest posterity of mankind; and make the name of FRANKLIN, like that of NEWTON, *immortal*.

I am, Sir, with sincere respect,  
your most obedient, and  
most humble servant,  
Ebenezer Kinnerley.

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XXIII. *Observations in Electricity and on a Thunder-storm: In a Letter from Mr. Torbern Bergman, to Mr. Benjamin Wilson, F. R. S. Acad. Reg. Upsal. Soc.*

Amplissime atque Celeberrime Domine,

Read April 14, 1763. **I**N epistolis recentissimis, quibus me honorasti, experimenta domini Delaval circa electricitatem crystalli Islandicæ commemoras. Pluries hæcce tentamina iteravi, sed constanter eventu prorsus contrario. Scilicet in hunc finem varia hujus crystalli frustra frigori 12 graduum exposui,  
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in thermometro Suecano, mercurio vivo impleto, frigus numero infra punctum congelationis aquæ, quod in nive colliquescente determinatur. (Quivis gradus est pars centesima distantiae punctorum congelationis et ebullitionis aquæ). Fricui dein post quarundam horarum spatium, sed nonnisi valde debilem electricitatem elicere potui. Hæc itaque iterum reposui, nondum satis frigefacta putans, et mane sequenti, dum interea mercurius in thermometro quosdam gradus descenderat, in camera non calefacta tentavi, sed adhuc minori successu. Unum igitur frustulum calefeci sperans hoc ipso omnem vim eradicari; sed inopinato non modo non destructam inveni dispositionem electricam, sed valde auctam. Idem mox repetii cum reliquis omnibus, eodemque semper effectu prima tentamina facta sunt cum crystallis objecta duplicantibus, quæ in Suecia erant collectæ: suspicio igitur mihi incidit has inter et revera Islandicas essentialem esse differentiam; itaque comparavi in Islandia natas, sed eadem monstrârunt phænomena \*.

Ex hisce tentaminibus cum domini Delaval collatis sequi videtur, diversas hujus crystalli dari species, quæ eo diligentius examinandæ, cum hucusque mineralogi non nisi unicam distinguant.

\* Mr. Delaval had already observed, in the letter here referred to by Mr. Bergman, that the property, in Iceland Crystal, of losing its electricity by a moderate heat, was not common to all kinds of it: and mentions in particular a piece of crystal, one part whereof, when heated gently, becomes non electric; while the other part, with the same heat, (or even with a much greater one) remains perfectly an electric. Vide Vol. LII. Part i. p. 355. I have seen the experiments several times which Mr. Delaval mentions, and they always succeeded as he has related them.

B. Wilson.

Memo-

Memorabilem fulminis ictum arcem regiam Upsalensem d. 24 Aug. 1760 ferientem, paucis describere forte non displicebit. Hoc die cœlum, præcedentibus serenum, nubibus atris obducebatur, e quibus pluvia per noctem decidebat. Post mediam vero noctem tonitrua audiebantur, quæ, duabus interjectis horis, horrendis fulgurationibus et fragoribus arcem adgrediebantur. Hæc arx insignem et natura et arte habet altitudinem, tectumque e laminis ferreis. Alæ australis paries transversus occidentalis et ipsius arcis murus primarius occidentalis, in contignatione præcipue infima, injuriis violentissimi hujus meteorii perturbabantur, unone, an pluribus fulminibus sese brevi insequentibus, non dicam. Murus sex diversis locis externe læsus est, et multis variisque intra arcem cameris, atriis vestibulisque percursis, per murum primum orientalem, urbem spectantem, fulmen exivisse videtur, nam foramen magnum fecerat ibidem. Ipsum ordinem hujus ictus nemo novit: effectus igitur præcipuos tantummodo colligam.

1° Ipse murus foraminibus, rimis, calceque lapides connectente fracta vel dissipata, violatus est. Lapidés magni cæsi, et adhuc liberi jacentes, diffracti sunt.

2° Ligna sunt tosta, imprimis in confinio ferri, sæpe diffracta, sæpe quoque illæsa hæc fortis electricitas transivit.

3° Sedecim quadrata vitrea unius fenestræ, absque ullo remanente vestigio vel frustulo in confinio, evanescebant. Speculi magni anguli duo oppositi liquefacti erant, foliumque ibidem turbatum, vitrum præterea illæsum, sed macula horizontalis duos pollices longa prope juncturam vitrorum in superiore speculi parte, omni folio carebat.

4° Clavi liquefacti. Picturarum et speculorum margines inaurati quasi tosti. In pavimento inauraturæ frustula conspiciebantur. Cymbalum clausum, quod sub una e picturis læsis constiterat, nullum læsionis signum externe monstrabat, nihilominus 15 fides e calybe abscissæ erant, et circa terminos candefactas fuisse signa aderant; in fundo chorda, tres lineas longa, inveniebatur, quam ignitam fuisse lignum tangens tostum indicabat.

5° Parietes imprimis læsi, adeoque directio ictus plerumque obliqua fuit, fluxui quoque aëris obtemperare visa.

6° Odor gravissimus alliaceo-sulphureus omnia implebat loca, sequentique die supellectilia et pavimenta floribus sulphuris adpersa inveniebantur.

7° Nullum animal læsum.

Æstate 1759 fulmen per caminum in parvam hujus urbis domum intrans per quadratum vitreum fenestræ perforatum mox horrendo fragore exivit. Sed præcipue memoratu dignum viros nonnullos, ab hoc loco ultra 250 pedes distantes, in terram decidisse, gravemque concussionem electricam fuisse expertos, dum interea hisce circumstantes nullo modo adficiebantur. Hoc eodem redit, ac dum interdum singuli in circulo explosionis constituti valde inæqualem concussionis gradum sentiunt. Permaneo

Celeberrimi nominis tui

Cultor observantissimus,

Dabam Upsalæ,  
d. xx Apr. 1762.

Torbern Bergman.